



# HAND PAPERMAKING

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FRONT COVER: Hong Hong, close detail of 41.7637° N, 72.6851° W, 2016, 12 x 8 feet, hand-poured kozo. Courtesy of the artist. BACK COVER: A page from a seventeenth-century sketchbook with child-sized handmarks (left). Photo by Donald Farnsworth.

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## *Letter from the Editor*

Paper's role as a recording device is firmly established in our minds. When we put pen to a sheet of onionskin, run a brush across the surface of cold-pressed watercolor paper, rub an inked woodblock onto washi, or push cardstock through an inkjet printer, we acknowledge paper's function to receive and hold information. But look deep into the material itself and we find that paper tells its own story, lays out the elements of its origins, and holds clues about what it has encountered over time. In this issue of *Hand Papermaking*, we will explore the evidentiary nature of paper, as well as its capacity to conceal secrets, and what a forensic analysis of paper can tell us about our culture and our own stories.

We start off the issue with Donald Farnsworth, who recounts his remarkable discovery of a special "maker's mark" in a sheet of seventeenth-century paper. Tim Barrett encourages us to "listen" closely to paper and provides clear and valuable instruction on how to do so using inexpensive, low-tech methods. Michael Durgin speaks with Marian Dirda on how the National Gallery of Art Paper Sample Collection has been employed to shed light on artists' use and choice of paper over time. Amy Hughes gives us an excellent example of how the collection supports the conservation of works on paper. In a fascinating, laudatory essay, Gary Frost advocates the codex book structure as a key preservation device for paper and for the transmission of thought and material culture. Izhar Neumann describes how, after being intrigued by an historical account, he reconstructed a papermaking screen using the reeds of the samar (rush) plant, then made paper with the screen from samar pulp. Neumann's article is accompanied by a sample from his papermaking trials. Barbara Rhodes outlines early methods, by the aid of chemistry, for secret writing, alteration of documents, and the introduction of safety features in handmade paper. Frank Brannon and Jeff Marley share their thoughts on the steganographic nature of paper—the concealing of information in plain sight—as a key element in their site-specific paper installations. Robert Riter introduces the work of Chris Davenport and Crane Giamo, followed by the artists' discussion of how they use handmade paper as applied ecological evidence for environmental forensics. Susan Mackin Dolan interviews the artist Hong Hong whose stunning, large-scale poured-pulp works are a record of what she describes as a "physical and philosophical engagement with the concept of time." We close the issue with a round-up of recent, noted exhibitions, and reviews of two new books: one on the history of Fabriano by Sylvia Rodgers Albro, reviewed by Minah Song; and a soft-cover release of Peter and Donna Thomases' interviews with retired papermakers from Tuckenhay Mill, reviewed by Bernie Vinzani.

I would like to take this opportunity to welcome our new designer Karen Kopacz. It's been a pleasure working with her on our first issue of the magazine together. Karen is based in St. Paul, near our main office, and she and Michael are beginning work on freshening up our overall look and design across our publications and platforms—stay tuned.

As always, we welcome your feedback and suggestions on what we cover in these pages. *Hand Papermaking* strives to be the primary chronicler of the ideas, research, and contemporary practice in our field. All of our publications—from the magazine to the newsletter and our handmade paper portfolios—serve to document, inform, and inspire. As such, we invite you to contribute to our shared record of the vibrant, intriguing work taking place in hand papermaking.

*Mina Takahashi*



## *Samar: A Papermaking and Mould-Making Plant*

IZHAR NEUMANN

*The author holds the samar screen, held in the wooden frame and deckle, ready to make paper samples for Hand Papermaking magazine, Summer 2017.*

*This article is adapted from a presentation given by the author at the 28th International Paper Historians meeting held in Cappellades, Spain, in 2006. It was published in the IPH Congress Book, vol. 16. –Ed.*

In the Hebrew and Arabic languages, “samar” is a word used to indicate *Juncus*, a plant known in English as rush. In the *Juncus* genus, there are about 150 species that grow in many parts of the world. In Israel, there are some 10 species of the perennial bush growing wild mainly in desert areas and along the sea coast, where there is a presence of high underground brackish water, and in swamps of brackish water rich in organic matter. In some areas of the Arava valley (in the south part of Israel), samar grows in abundance and can reach a density of 1.5 to 4 tons of green material per dunam (1,000 square meters).

As samar grows so well in Israel, papermaking experiments were carried out in the mid-1950s to evaluate the use of samar as a source of papermaking fiber for the young country’s developing paper industry.<sup>1</sup> In 1953, 15 tons of samar were collected from the wild in Israel and sent to Scotland for testing. They found that samar has good qualities for papermaking: “In general, *Juncus* fiber gives a paper...good bulking and handling properties and good strength...”<sup>2</sup> Based on these results, a farm was set up in the Arava valley to grow samar intensively. The farm supplied fiber until the mid 1960s. In a rare coincidence, both my father and his older brother were involved



Harvesting samar in Birkat Samar, Summer 2005. The city of Hadera can be seen in the background.

in this project. My father, then a young student in the Hebrew University in Jerusalem, worked on the farm in the Arava during his summer vacation in 1956. His job was to measure the growth rate of the newly planted samar. A few years later, on the north side of Israel, my uncle, who was appointed to run a pulp mill set up next to the new papermill in the city of Hadera, checked several local plants for their potential use, among them samar from the Arava, without knowing his brother's involvement there.<sup>3</sup>

Having this family background, I thought of samar as papermaking fiber, so I was intrigued to see that R.H. Clapperton, in his book *Paper: An Historical Account*, mentions samar not as a source of papermaking fiber but as the reeds from which the Arabs made their papermaking screens, much like bamboo was used in the Far East. Clapperton cites an anonymous Arabic manuscript *Umdet-el-Kuttab* dating to the first half of the twelfth century: "The mould was made from fine reeds of Samar, interlaced like lobster baskets."<sup>4</sup> This caught my attention and I decided to try to reconstruct a papermaking screen from samar. As the reeds of the plant are long and cylindrical, with no knots and no leaves, with almost the same diameter all along the length of the stalk, it made sense to me that samar would be suitable for this purpose. Historically samar reeds—with their length, flexibility, and strength—were used in the Middle East for weaving baskets and mats, similar to a papermaking screen.<sup>5</sup>

It is possible that samar could have been used in the past as a source of papermaking fiber. It is low in lignin content and rela-

tively high in cellulose. However I have not found any historical reference mentioning it nor have I seen any old specimens containing samar fibers. From my own research, papers from that period in the Arab region were mainly made from cotton and flax.<sup>6</sup>

In 2005, I started my papermaking and mould-making experiments with samar. Near the city of Hadera, I located an area rich with samar, in a place called Birkat Samar (Samar pond), which lies in the midst of sand dunes. The species I found suitable for the papermaking screen is called "samar had" in Hebrew (in English, spiny rush or sharp-pointed rush). The reeds grow to a height of 80 to 150 centimeters (31 inches to 5 feet) with needle-like tips. In the summer I cut the green reeds using a sickle, and brought them home. Some I used for making paper and some for making the screen.

The first step in making the screen involved careful sorting of the reeds. In Japan, the screen is made from bamboo splints that are perfectly round and uniform in diameter. The splints are made by pulling strips of bamboo through a drawplate with round holes, much like the process by which metal wire is made. In the case of samar I was dealing with a natural reed that has many variables, so I had to sort them by hand and eye. The parameters I looked for were: (1) straight reeds (neither twisted nor curved); (2) round reeds (some were flat); (3) healthy and complete reeds with no defects; and (4) a diameter between 1.7 and 2.2 millimeters.

After drying the sorted, green reeds in the shade under pressure



*Sorting samar reeds for making the screen, Summer 2005.*



*Weaving the screen, Summer 2005. The laid lines are samar reeds; the chain lines are horsetail hair. Garden-hose segments are used as bobbins.*

for one month, I wove the reeds into a screen using the Japanese technique of bamboo “su” weaving as described by Tim Barrett.<sup>7</sup> I built a simple loom and for the weights (bobbins), I cut up a garden hose and filled the segments with sand. For the chain lines, I used horse hair following Loeber’s book about old paper-mould construction.<sup>8</sup> The hair is from the horse tail and is quite strong; it is the same hair used for violin bows. Since the lengths of hair were not long enough, I tied three pieces of hair, end to end, to make each chain line.

The weaving itself took me about a month with the help of my daughter. I was careful to apply even tension on the hair, to keep the chain lines straight and to place the reeds in alternating directions. At the near and far edges, I affixed a flat bamboo strip. The screen has an average of 11 to 12 laid lines per inch (9 to 10 laid lines per 20 millimeters). The chain lines alternate between 15 and 30 millimeters apart.

To make paper, I use the samar screen supported by a simple wooden frame and deckle. I am able to make good sheets, with some adjustments to my usual technique and careful attention to preparing the fiber.

Triggered by Clapperton’s book, I have verified that samar can be used for making both the mould and paper. My experiments also seem to confirm that old Arabic paper, often having variations in laid lines, could very well have been made on samar screens given



*Close-up view of weaving the screen. Note the two different spacings between the chain lines.*



Soaking the samar reeds before cooking when making the pulp, Summer 2017.



Couching off the paper, Summer 2005. Note the holes in the upper part of the freshly made paper, where the screen was blocked.



Samar paper drying on Formica boards, Summer 2017. Note the two surfaces of the paper sample—the smooth side faced the board.

the natural variability in the diameters of the samar reeds. Another aspect of old Arabic manuscripts that have perplexed paper historians has been the apparent lack of chain lines in the paper. What might explain this phenomenon is the use of horse hair for the chain lines in the fabrication of a samar screen. The chain lines in the sheets I have made with my samar screen are hardly visible.

As a papermaker living in Israel, I feel as a link in the long chain of tradition. The art of papermaking originated in China and spread westward to Europe by the Arabs and Jews during the eighth through twelfth centuries. Paper made in the Middle East in that period was known for its high quality, and was exported to Europe. Craftspeople living in the Middle East region developed many papermaking techniques including the introduction of cotton as a fiber source and paper sizing methods, and thus served as a bridge between East and West. I was trained both in Japan and in the West, and feel obliged to continue both the long traditions of washi and Western papermaking. I am privileged to be able to contribute to the understanding of these craft traditions, and to pass my knowledge to my son Shaked, now 30, who continues the craft as a third-generation papermaker.

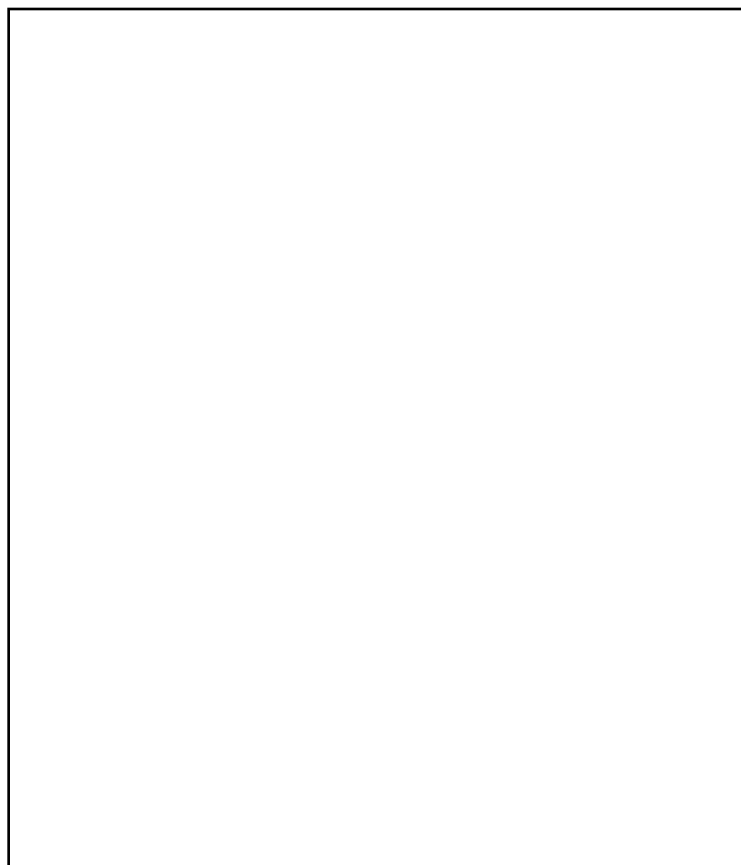
*The author wishes to dedicate this article to the memory of his father, Professor Joseph Neumann. He nearly lost his life when a bus taking him to the samar fields in Arava valley was attacked by terrorists on August 16, 1956. He later became a professor at Tel Aviv University and died peacefully in April 2017 at the age of 87.*

#### NOTES

1. Menachem Lewin, "Desert Plants in Israel as Potential Sources of Cellulose," in *Desert Research Proceedings of an International Symposium*, Jerusalem, May 1952, Israel Research Council Publication no. 2 (1953): 346–349.
2. See "Trials of *Juncus* for Cellulose & Papermaking," a report of tests carried out by Kilbagie Paper Mills, Scotland, 1953.
3. I wrote a detailed account in Hebrew about the connection of my family to papermaking, which I found out about much later after I decided to become a papermaker. It is a self-published hand-bound book, with samar paper cover and sample, in an edition of 12 for my family circle.
4. R.H. Clapperton, *Paper: An Historical Account of its Making by Hand from the Earliest Times down to the Present Day* (Oxford: Shakespeare Head, 1934), 69.
5. Rushes (igusa in Japanese) are still used today to make tatami mats in Japan.
6. For more, see Zohar Amar, Azriel Gorski, and Izhar Neumann, "Raw Materials in the Paper and Textile Industry in al-Sham during the Middle Ages in Light of an Analysis of Documents from the Cairo Genizah," a paper I presented at the 27th International Paper Historians meeting in Duszynki Zdroj, Krakow, Poland, published in *IPH Congress Book*, vol. 15 (2004): 39–44.
7. Timothy Barrett, *Japanese Papermaking: Tradition, Tools, and Techniques* (New York: Weatherhill, 1983), 88–115.
8. E.G. Loeber, *Paper Mould and Mould Makers* (Amsterdam: The Paper Publication Society, 1982), 42.

## *Paper Sample: Samar*

IZHAR NEUMANN



I harvested samar plants from the wild, near the Israeli town of Acre, from the mouth of the Na'aman river. After soaking the reeds in water for 3 days, I beat them with a wooden mallet to soften the outer layer, then cooked them in a 12-percent NaOH (sodium-hydroxide) solution for 2.5 hours. After thorough rinsing, I used a Hollander beater. At first it got all tangled, so I started with some abaca (about 10 percent by weight) in order to start the flow, then slowly added the cooked reeds, and beat for about 40 minutes.

To form the sheets, I used my samar screen with a Japanese frame and deckle, following the *hantamezuki* technique: the first few dips in the *nagashizuki* method, moving the slurry back and forth and throwing off the mould, and then a deep scooping to let the fibers settle on top with gentle rocking. After a few sheets, I began to encounter big problems in the sheet formation. After much trial and frustration, I finally realized that the samar reeds in the screen were swelling up and blocking some areas. This created huge holes in the paper. To overcome this problem, I used two screens alternately—the samar screen that I made using horse hair, and another screen that was made for me by

Ito-san in Japan. She is a master *su* (screen) maker, who normally weaves them from bamboo. I sent her samar reeds from Israel and she wove them into a papermaking screen using synthetic thread. Changing out the screen every five or so sheets allowed the screens to dry in between. If the chain lines in your sample are visible, it came from a sheet made with Ito-san's samar screen. If they are nearly invisible, the sample came from a sheet made with the screen I wove with horse hair.

After pressing the stack in my screw press, I dried them on Formica boards for a day, sorted them, and sent them to America.

In conclusion, I realized that mould-making is a very complicated craft that enables the papermaker to make consistent and even sheets for a long time! If I would continue my screen-weaving adventure, I would improve two aspects: 1) I would soak the reeds before weaving; and 2) I would weave the screen using a 2-to-3-ply thread from horse hair.